

WG21 2020-11 Virtual Meeting

Record of Discussion

ISO/IEC JTC1 SC22 WG21 P2260 — 2020-11-19

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Chair John Spicer

1. Opening activities

John Spicer opens the meeting at 11:02 AM UTC-5

1.1. Opening comments (PL22.16)

John Spicer presents.

Thank you for all the work we were able to get done in these challenging times.

1.2. Meeting guidelines

John Spicer presents

Meetings are not public, but are open to visitors. Please refrain from live tweeting, blogging, taking photos or videos.

Every participant is responsible for understanding and abiding by the following:

[The INCITS Antitrust Guidelines](#) (PL22.16)

[The INCITS Patent Policy](#) (PL22.16)

[The ISO Code of Conduct](#)

[The IEC Code of Conduct](#)

[The WG21 Practices and Procedures, and Code of Conduct](#)

John Spicer presents the meeting guidelines. Please make sure you are familiar these documents. The links are on the wiki.

If you have any questions or concerns about CoC issues, please approach a committee officer or a NB representative and bring it to their attention. If you have any technical

issues or concerns, please bring them up as soon as possible.

1.3. [The ISO Code of Conduct:](#)

ISO requires that, through 2020, committees provide an opportunity to discuss the code of conduct.

Herb presents.

We are having a CoC related poll, which we will discuss later in the meeting. We also had a poll among the chairs and one of the requests was to elaborate on what the CoC means. This is my view of what CoC is about. It can be summarized as “respect”, and that covers and subsumes:

"be professional"

"don't be offensive" and "don't be easily offended"

"avoid language policing"

"act in good faith" and "assume others are acting in good faith"

"report complaints instead of lashing out"

"escalate technical disputes early"

"don't be a jerk"

John presents ISO CoC slides.

If you believe a violation has been committed, you can report it to @conduct, as well as committee officers.

1.4. Membership, voting rights, and procedures for the meeting (PL22.16)

John presents voting rights.

If you are representing an organization that is considering formally joining PL22.16, or your organization is already a member and you wish to change your voting status, please inform an officer.

Please sign the virtual attendance sheet which can be found in the chat and on the wiki page.

John instructs how to vote using the telecon client.

1.5. Introductions

Officers introduce themselves.

New members introduce themselves.

1.6. Agenda review and approval (PL22.16 motion, WG21 poll)

The meeting goals described above are derived from the schedule adopted in 2020 and described in: [P1000R4](#)

The primary goal of this meeting will be to provide any necessary status updates and conduct straw polls proposed for working draft changes.

John presents the agenda.

Walter Brown : I have a comment on the agenda before we vote on it. One of the document titles in the INCITS motions is not correct.

Barry: we can remove the title and leave the number of the document.

PL22/16 motion to approve the meeting agenda, with the changes to the agenda as discussed.

Jonathan Wakely Moves

Juan Alday seconds.

The motion is unanimously approved by PL22/16.

WG21 motion to approve the meeting agenda, with the changes to the agenda as discussed.

The motion is unanimously approved by WG21.

1.7. Editor's reports, approval of working drafts

Document	Editor's report	Prospective WD
C++20 Standard	N4867	N4868
Library Fundamentals TS	N4854	N4853

WG21 motion to approve the working drafts.

The motion is unanimously approved by WG21.

Nico Josutiis : what are the changes in the working draft since we voted in C++20 ?

Richard Smith : We have addressed some of the motions which were misapplied to the working draft. All of the other changes are purely editorial.

1.8. Approval of the minutes of the previous meetings (PL22.16 motion, WG21 poll)

Note: The Prague minutes and pre-meeting telecon were updated on November 9th. The Prague minutes were changed to correct the NB affiliation of two members. The telecon minutes corrected two typos.

Meeting	Minutes
WG21 Prague	N4870
PL22.16 Prague	pl22.16-2020-00002
WG21 pre-November Virtual administrative telecon	N4871

PL22/16 motion to approve the minutes.
Hubert Tong moves.
Daveed Vandevoorde seconds.
The motion is unanimously approved by PL22/16.

WG21 motion to approve the working drafts.
The motion is unanimously approved by WG21.

2. Liaison reports, and WG21 study group reports (see pre-meeting WG21 telecon minutes)

No discussion.

3. WG progress reports (Core, Evolution, Library, Library Evolution; see pre-meeting WG21 telecon minutes)

No discussion.

4. New business requiring action by the committee

No discussion.

5. Discussion and Straw Polls

5.1. Core Straw Polls

1. Accept as Defect Reports all issues in P2238R0 (Core Language Working Group "tentatively ready" Issues for the November, 2020 virtual meeting) and apply the proposed resolutions to the C++ working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

2. Apply the changes in P0330R8 (Literal Suffix for (signed) size_t) to the C++ working paper.

No discussion.

There are objections in the room

Herb reminds of the voting rules.

In favour : 53

Opposed :1

Abstain : 11

Re-taking the vote due to technical issues with the telco client.

In favour : 53

Opposed :1

Abstain : 12

Motion passes

3. Apply the changes in P2096R2 (Generalized wording for partial specializations) to the C++ working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

4. Apply the changes in P2029R4 (Proposed resolution for core issues 411, 1656, and 2333; numeric and universal character escapes in character and string literals) to the C++ working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

5. Apply the changes in P1787R6 (Declarations and where to find them) to the C++ working paper. (These changes resolve core language issues

36 110 138 191 255 271 279 338 360 386
399 405 418 536 554 562 563 600 607 852
952 1028 1200 1252 1291 1478 1500 1616 1729 1771
1818 1820 1821 1822 1828 1829 1835 1837 1839 1841
1884 1894 1896 1898 1900 1907 1908 1936 2007 2009
2058 2062 2065 2070 2165 2199 2213 2331 2370 2396
2413

In addition, issues

325 361 1089 1635

are partially resolved.)

Mike Miller presents. Thank you for all the work that went into this. Davis has been working on this for well over a year, and we spent many hours in core reviewing it. This is a major improvement.

We haven't individually considered which of the resolved issues should be DRs, we will do so in one of the future core meetings. We will have a follow up motion in the next meeting for issues that should be considered as DRs against C++20.

No discussion.

No objection to unanimous consent.

Motion passes.

5.2. Library Straw Polls

Library Fundamentals

1. Apply the changes for Issue 3413 in P2236R0 (C++ Standard Library Issues to be moved in Virtual Plenary, Nov. 2020) to the Library Fundamentals TS working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

Networking

2. Apply the changes for Issue 3443 in P2236R0 (C++ Standard Library Issues to be moved in Virtual Plenary, Nov. 2020) to the Networking TS working paper.

Bryce Adelstein Lelbach : can you clarify what is meant by working paper is here? My understanding is that we won't publish another Networking TS revision, and that the P paper will eventually be merged in the IS.

Jonathan Wakely : In order to have a target for this there will be a new working draft that might just have this change. We can also vote in the next plenary to apply C++20 rebase changes to the networking draft.. There is no intention to do another version of the TS, but we might have a rolling draft as a target for any changes.

No objection to unanimous consent.

Motion passes.

Issues

3. Apply the changes for all Ready and Tentatively Ready issues in P2236R0 (C++ Standard Library Issues to be moved in Virtual Plenary, Nov. 2020), except for issues 3413 and 3443, to the C++ working paper.

Jonathan Wakely : the intention is that all tentatively NAD issues in this paper will move to NAD after this meeting. We are not voting on them in this meeting. They are there for information purposes.

No discussion.

No objection to unanimous consent.

Motion passes.

C++23

4. Apply the changes in P1679R3 (string contains function) to the C++ working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

5. Apply the changes in P0881R7 (A Proposal to add stacktrace library) to the C++ working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

6. Apply the changes in P2227R0 (Update normative reference to POSIX) to the C++ working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

7. Apply the changes in P1048R1 (A proposal for a type trait to detect scoped enumerations) to the C++ working paper.

Nico Josuttis : there is an editorial remark that the new trait should be located in a different place in the standard.

Jonathan : I'll make the editorial fix

No objection to unanimous consent.

Motion passes.

8. Apply the changes in P0943R6 (Support C atomics in C++) to the C++ working paper.

No discussion.

No objection to unanimous consent.

Motion passes.

6. Closing activities

6.1. Other business

Herb Sutter presents.

We did a WG21 pulse poll to check how we're doing. Thank you for your responses. We might do this again in the future to track progress over time.

We discussed having a welcome reception for the newcomers when we go back to face to face meetings where we can introduce them to how the meetings work.

Over 60% participants responded that they often feel exhausted by meetings and demands from all sources, not just WG21 meetings. Thank you for participating when you can.

Thank you for your patience. We need to have trust so we can work well as a group. It's unlikely we will have a face to face meetings soon.

Over 40% expect to spend significantly less time working in the next 6 months (vs a normal year). Subgroup chairs will take this into account.

46% said that the current pace of virtual meetings is not sustainable (We had around 150 virtual meetings since the pandemic began). Subgroup chairs will take this into account. We will continue this discussion.

47 EWG+LEWG+LWG - I haven't been attending, but regularly attended face to face meetings

45 SG7+EWG+LEWG+LWG - I haven't been attending, but would if there weren't so many other meetings

Hana Dusíková : there have been no SG7 meetings since Prague.

Herb Sutter : I assume they haven't even checked if there was a meeting because they were so busy.

JF Bastien : I believe Hana was pointing out that people claim they have been attending SG7, even though there were no meetings. We should take the poll results with a grain of salt.

Some people have also said they are happy with the pace. I think this should be also

pointed out. We need to be careful how we interpret these results.

Herb Sutter : we want to see where we need to make adjustments. I will calibrate this to represent also those who are happy with the current meeting schedule.

Bryce Adelstein Lelbach : JF and I have an attendance list, and we wouldn't hold a meeting if we didn't have a quorum of regular attendees.

Herb Sutter continues.

4% don't feel welcome. We will reach out to see if we can do anything about it.

A little over a third felt the culture was disagreeable because of CoC violations.

A little bit less than that felt the culture was disagreeable because of over-control behaviour

We would like to reduce the dissatisfaction by listening to concerns people have. This is a beginning of a conversations and something that I and the leaders will continue working on

Daveed Vandevoorde : It is possible be in favor of both.

Herb Sutter continues. This is just to get an idea of how we are doing. I will reach out to those who were not anonymous to see what we can do better. I will need everyone's help to make this better. If you have serious concerns, please let us know. We need to say this more explicitly. You can send your concerns to @conduct. Please think first and assume good faith as we're all stressed this year.

6.2. PL22.16 motions, if any

John reminds of voting rights for PL22.16

- 1) **Move that PL22.16 adopts the Systematic Review for ISO/IEC 29124:2010 (vers2)-~~Special Math~~ to withdraw that Standard per document [pl22.16-2020-00006-001](#).**

Bryce Adelstein Lelbach moves.

Daveed Vandevoorde seconds.

In favour: 32

Against: 0

Abstain: 0

Motion approved.

- 2) **Move that PL22.16 adopts the Systematic Review for ISO/IEC TS 21425, C++**

Extensions for Ranges to withdraw that Technical Specification per document [pl22.16-2020-00007-001](#)

Daveed Vandevoorde moves.
Bryce Adelstein LeBach seconds.

In favour: 33
Against: 0
Abstain: 0

Motion approved.

3) Move that PL22.16 adopts the Systematic Review for ISO/IEC TS 21425, C++ Extensions for Ranges to withdraw that Technical Specification per document [pl22.16-2020-00007-001](#)

Daveed Vandevoorde moves.
Bryce Adelstein LeBach seconds.

In favour: 33
Against: 0
Abstain: 0

Motion approved.

7. Plans for the future (PL22.16)

7.1. Next and following meetings

2021-2-?: Virtual

~~2021-05-31/06-05: Varna Bulgaria (tentative)~~

Herb presents : we will likely not meet in Varna. More details soon in an email to the meeting reflector.

It's unlikely that we will have any face to face meetings next year. We will continue to meet virtually.

2022-02-07 to 12: Portland, OR, USA; Intel (tentative)

7.2. Mailings

Note: These are the closest regular mailings and not special pre/post meeting mailings.

2020-11-15: Post-November

2020-01-15: Pre-February

8. Adjournment (PL22.16 motion)

Walter Brown presents.

Thank you to the hosts that haven't and won't be able to host us.

Thank you to all the people who have made the meetings possible and to everyone who has been involved.

All : thank you to Walter Brown for all the contributions.

PL22.16 motion to adjourn.

Daveed Vandevoorde moves.

Hubert Tong seconds.

Approved by unanimous consent.

John Spicer adjourns the meeting at 12:29 pm UTC - 5.

9. Attendance

Name	Organisation	National Body
Aaron Ballman	Intel	United States
Alexandru Voicu	AMD	United States
Alisdair Meredith	Bloomberg LP	United Kingdom
Andreas Weis	BMW AG	Germany
Andrew Sutton	Lock3 Software	United States
Antony Peacock	Maven Securities	United Kingdom
Antony Polukhin	Yandex	Russia
Attila Farkas Fehér	Bloomberg LP	United States
Balint Joo	Oak Ridge National Laboratory	United States

	(ORNL)	
Barry E Hedquist	Perennial, Inc.	United States
Barry E Hedquist	Perennial, Inc.	United States
Barry Revzin	Jump Trading	United States
Ben Caimano	MongoDB	United States
Ben Craig	NI	United States
Benjamin Saks	Saks & Associates	United States
Bill Ash	INICTS	United States
Billy Baker	FlightSafety Internation	United States
Bjarne Stroustrup	Morgan Stanley	United States
Bob Steagall	KEWB Computing	United States
Botond Ballo		Canada
Bronek Kozicki	BSI	United Kingdom
Bruno Cardoso Lopes	Facebook	United States
Bryan St. Amour	Tessonics	Canada
Bryce Adelstein Leibach	NVIDIA	United States
Chandler Carruth	Google, Inc	United States
Christian Trott	Sandia National Laboratories	United States
Christof Meerwald	Programming Research	United States
Colin MacLean	LBNL	United States
Corentin Jabot		France
Daisy (formerly David) Hollman	Sandia National Labs	United States
Damien Lebrun-Grandie	Oak Ridge National Laboratory	United States
Dan Raviv	Sound Radix	Israel
Daniela Engert	GMH Prüftechnik GmbH	Germany
Daniela Engert	GMH Prüftechnik	
Daveed Vandevoorde	Edison Design Group	United States
David Olsen	NVIDIA	United States

David Sankel	Bloomberg	United States
Davis Herring	Los Alamos National Laboratory	United States
Detlef Vollmann	vollmann engineering gmbh	Switzerland
Dr Peter TB Brett	Cadence Design Systems	United Kingdom
Drew Dormann	Aquatic	United States
Ellen Herrick	EDG	United States
Eric Niebler	Facebook	United States
Erich Keane	Intel Corporation	United States
Fabio Fracassi	CODE University of Applied Science	Germany
Faisal Vali		United States
Felix Hellmann		Germany
Florian Sattler		Germany
Frank Birbacher	Bloomberg L.P.	United Kingdom
Gabriel Dos Reis	Microsoft; Microsoft France	France
Gašper Ažman	Citadel Securities	United Kingdom
Graham Lopez	NVIDIA	United States
Guy Davidson	Creative Assembly	United Kingdom
Hal Finkel	US Department of Energy	United States
Hana Dusíková	AVAST	Czech Republic
Herb Sutter	Microsoft	United States
Howard Hinnant	Ripple	United States
Hubert Tong	IBM Corporation	Canada
Inbal Levi	Solar Edge	Israel
Jason Carey	MongoDB	United States
Jason Merrill	Red Hat	United States
JC van Winkel	Google	Netherlands
Jean-Paul RIGAULT	Université Côte d'Azur and INRIA	France

JeanHeyd Meneide	NEN	Netherlands
Jeff Garland	CrystalClear Software, Inc	United States
Jens Maurer	Edison Design Group	United States
JF Bastien	Toyota Research Institute— Advanced Development	Canada
John Spicer	Edison Design Group	United States
Jonathan Caves	Microsoft Corporation	United States
Jonathan Wakely	IBM	United Kingdom
Joshua Berne	Bloomberg LP	United States
Juan Alday	GreenWireSoft	United States
Kelly Walker	Stellar Science Ltd Co	United States
Lars Gullik Bjønnes	Cisco	United States
Loic Joly	SonarSource	France
Łukasz Wojakowski	PKN	Poland
Maged Michael	Facebook	United States
Mark Hoemmen	Stellar Science	United States
Mateusz Pusz	Train IT	Poland
Mateusz Pusz	EPAM Systems	United States
Matthew Butler	Laurel Lye	United States
Matthias Kretz	GSI Helmholtz Centre for Heavy Ion Research	Germany
Michael Florian Hava	RISC Software GmbH	Austria
Michael Garland	NVIDIA	United States
Michael Park	Facebook	Canada
Michael Spertus	Amazon	United States
Michał Dominiak	Nvidia	Poland
Mike Herrick	Edison Design Group	United States
Nathan Sidwell	Facebook	United Kingdom
Neil Horlock	Zyxt Technology	United Kingdom

Nemanja Boric	Amazon Corporate LLC	United States
Nevin Liber	Argonne National Laboratory	United States
Nicolai Josuttis		Germany
Nina Ranns	Edison Design Group	United Kingdom
Pablo Halpern	Halpern-Wight Software, Inc.	United States
Patrice Roy	Université de Sherbrooke	Canada
Paul Preney	University of Windsor / SHARCNET	Canada
Philip Craig	BSI C++	United Kingdom
Richard Smith	Google	United States
Robert Allan Hennigan Leahy	MayStreet Inc.	Canada
Robert Douglas	Aquatic	United States
Robert J. Simpson	Qualcomm Technologies Inc.	United Kingdom
Roger Orr		United Kingdom
Sebastian Büttner		Germany
Shuo Feng Liu	IBM Canada Ltd.	Canada
Stephen Scott Schurr	Ripple	United States
Steve Downey	Bloomberg LP	United States
Thomas Köppe	Google DeepMind	United Kingdom
Thomas Richard William Scogland	LLNL	United States
Thomas Wise	Microsoft	United States
Tim Costa	NVIDIA	United States
Tim Song	Jump Trading	United States
Timur Doumler		United Kingdom
Tom Honermann	Synopsys, Inc.	United States
Tony Van Eerd	Christie Digital	Canada
Tristan Brindle	BSI	United Kingdom
Tyler Sutton	Lock3 Software	United States

Vassil Vassilev		Bulgaria
Victor Zverovich	Facebook	United States
Ville Voutilainen	The Qt Company	Finland
Walter E. Brown		United States
Wesley Maness	Schonfeld	United States
William A. Seymour		United States
WILLIAM M MILLER	Edison Design Group	United States
Wuping Xin	KLD Engineering, P. C.	United States
Wyatt Childers	Lock3 Software	United States
Yevgen Maltsev	TOPIC software development	Netherlands
Zachary Henkel	Microsoft	United States
Zhihao Yuan	SimpleRose Inc	United States
Michael Wong	Codeplay	Canada
Dietmar Kuhl	Bloomberg	United States
John Lakos	Bloomberg	United States
Lee Howes	Facebook	United States
Mitsuhiro Kubota		Japan
Sam Goodrick	Lock3 Software	United States
Olivier Giroux	NVIDIA	Unites States